AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims

1. (Currently amended): A method for preparing an aqueous urethane resin composition, comprising the ordered steps of:

(1) producing an aqueous polyurethane resin solution by:

(a) reacting 100-150 parts by weight polyester polyol, [[.]] 30-50 parts by weight diisocyanate, 5-15 parts by weight dimethyl propionic acid or dimethyl butyric acid, and 3-10 parts by weight amine at 55-85 °C for 5-6 hours to give a prepolymer ranging, in NCO radical content, from 2 to 8%, said dimethyl propionic acid or dimethyl butyric acid serving as a hydrophilic moiety for water dispersion;

(b) dispersing the prepolymer at 30-40 °C in water; and

(c) introducing into the water-dispersed prepolymer a chain extender selected from the group consisting of glycol, triol and diamine at 25-30 °C in such a way that the reaction mole ratio between said chain extender and NCO residues is controlled to give the final product with a number average molecular weight of 30,000-100,000;

(2) adding to the aqueous polyurethane resin solution, ~~with block isocyan type~~ a blocked isocyanate or an aziridine ~~type~~ curing agent at

an amount of 3-15% by weight based on the weight of the resin solid content to cure the polyurethane resin.

2. (Currently amended): A method for preparing an aqueous lubricant urethane resin composition, comprising the ordered steps of:

(1) producing an aqueous polyurethane resin solution by:

(a) reacting 100-150 parts by weight polyester polyol, 30-50 parts by weight dimethyl propionic acid or dimethyl butyric acid, and 3-10 parts by weight amine at 55-85 °C for 5-6 hours to give prepolymer ranging, in NCO radical content, from 2 to 8%, said dimethyl propionic acid or dimethyl butyric acid serving as a hydrophilic moiety for water dispersion;

(b) dispersing the prepolymer at 30-40 °C in water; and

(c) introducing into the water-dispersed prepolymer a chain extender selected from the group consisting of glycol, triol and diamine at 25-30 °C in such a way that the reaction mole ratio between said chain extender and NCO residues is controlled to give the final product with a number average molecular weight of 30,000-100,000;

(2) adding to the aqueous polyurethane resin solution, a blocked isocyanate ~~with block isocyan type~~ or an azidirine ~~type~~ curing agent at an amount of 3-15% by weight based on the weight of the polyurethane resin solid content to cure the polyurethane resin;

(3) adding a wax mixture comprising a fluorine resin-modified polyethylene wax and a polyethylene wax at a weight ratio of 1:0.3-1:0.7 to the polyurethane resin solution at an amount of 5-30% by weight based on the weight of the polyurethane resin solid content, said fluorine resin-modified polyethylene wax ranging, in specific gravity, from 0.98 to 1.02 with a particle size of 0.1-1.5 μm, said polyethylene wax ranging, in molecular weight, from 1,500 to 3,000 with a particle size of 0.05-1.0 μm;

(4) adding a colloidal silica in the resin solution obtained in the step (3) at an amount of 10-30% by weight based on the weight of polyurethane resin solid content;

(5) adding in the resin solution obtained in the step (4) a coupling agent selected from the group consisting of silane coupling agents containing an epoxy group, an amine group, and/or an acryl group and titanium coupling agents containing phosphorus and/or an amine group at an amount of 0.1-0.5% by weight based on the total weight of the polyurethane resin solid content; and

(6) diluting the resin solution with pure water into a final ~~resin~~ solid content of 10-30% by weight.

3. (Previously presented): The method as set forth in claim 1, wherein said polyester polyol is used at an amount of 120-130 parts by weight based on the weight of the prepolymer reactants.

4. (Previously presented): The method as set forth in claim 1, wherein said diisocyanate is used at an amount of 35-40 parts by weight based on the weight of the prepolymer reactants.

5. (Previously presented): The method as set forth in claim 1, wherein said hydrophilic moiety for water dispersion is used at an amount of 8-10 parts by weight based on the weight of the prepolymer reactants.

6. (Original): The method as set forth in claim 2, wherein said wax mixture is used at an amount of 10-15 parts by weight based on the weight of the prepolymer reactants.

7. (Previously presented): The method as set forth in claim 1, further comprising the step of adding acetone and/or n-pyrrolidone solvent at an amount 10 % by weight based on the weight of the prepolymer reactants, before the dispersing step.

8. (Currently amended): The method as set forth in claim 1, wherein said polyol is a polybutylene adipate ~~based~~ polyester polyol with a number average molecular weight of 500-3,000.

9. (Previously presented): The method as set forth in claim 1, wherein said diisocyanate is selected from the group consisting of diphenylmethane diisocyanate, isophorone diisocyanate, and tolylene diisocyanate.

10. (Previously presented): The method as set forth in claim 1, wherein said amine is triethyl amine.

11. (Currently amended): The method as set forth in claim 1, wherein said chain extender is selected from the group consisting of glycols, ~~such as ethylene glycol, 1,4 butylene glycol, and 1,6 hexane diol,~~ diamines, ~~such as ethylene diamine and isophorone diamine,~~ triols ~~such as trimethylol propane,~~ and mixtures thereof.

12. (Currently amended): A method of surface treatment for chromated, electroplated steel plates, comprising the steps of: providing a zinc-electroplated steel plate chromated at a chrome amount of 4-200 mg/m^2, coating said steel plate with an aqueous lubricant urethane resin produced according to claim 2 at a dry coating thickness of 0.5-5.0 μm, baking the steel plate at a steel temperature of 110-200 ^{o}C, and quenching the steel plate in water.

13. (Previously presented): The method as set forth in claim 2, wherein said polyester polyol is used at an amount of 120-130 parts by weight based on the weight of the prepolymer reactants.

14. (Previously presented): The method as set forth in claim 2, wherein said diisocyanate is used at an amount of 35-40 parts by weight based on the weight of the prepolymer reactants.

15. (Previously presented): The method as set forth in claim 2, wherein said hydrophilic moiety for water dispersion is used at an amount of 8-10 parts by weight based on the weight of the prepolymer reactants.

16. (Previously presented): The method as set forth in claim 2, further comprising the step of adding acetone and/or n-pyrrolidone solvent at an amount 10 % by weight based on the weight of the prepolymer reactants, before the dispersing step.

17. (Currently amended): The method as set forth in claim 2, wherein said polyol is a polybutylene adipate ~~based~~ polyester polyol with a number average molecular weight of 500-3,000.

18. (Previously presented): The method as set forth in claim 2, wherein said diisocyanate is selected from the group consisting of diphenylmethane diisocyanate, isophorone diisocyanate, and tolylene diisocyanate.

19. (Previously presented): The method as set forth in claim 2, wherein said amine is triethyl amine.

20. (Currently amended): The method as set forth in claim 2, wherein said chain extender is selected from the group consisting of glycols, ~~such as ethylene glycol, 1,4 butylene glycol, and 1,6 hexane diol,~~ diamines, ~~such as ethylene diamine and isophorone diamine,~~ triols ~~such as trimethylol propane,~~ and mixtures thereof.